

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61B 17/32	A1	(11) International Publication Number: WO 95/13750 (43) International Publication Date: 26 May 1995 (26.05.95)
(21) International Application Number: PCT/US94/12982	(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 10 November 1994 (10.11.94)		
(30) Priority Data: 08/151,862 15 November 1993 (15.11.93) US	Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(71)(72) Applicant and Inventor: SCHRAGA, Steven [US/US]; 1841 N.E. 146 Street, North Miami, FL 33181 (US).		
(74) Agent: MALLOY, Jennie, S.; Malloy & Malloy, P.A., One Biscayne Tower, Suite 3760, Miami, FL 33131 (US).		
(54) Title: SINGLE USE LANCET DEVICE		
(57) Abstract		
<p>A single use disposable lancet device (10) includes a housing (12, 14) containing a spring (18). The spring (18) has a first end (20) fixed in the housing (12, 14) and a second end zone which is movable relative to the housing (12, 14) and has a pointed blade or terminal end (22). The terminal end (22) is within the housing (12, 14) and moves between a cocked pre-stressed position completely within and with potential energy stored in the spring (18) and a piercing position with the second end zone in an opening (26) and the pointed terminal end (22) momentarily exterior of the housing (12, 14). The housing also has a lever arm (28) with a holding tip (24) maintaining the second end zone in the cocked position until it is moved by an operator. Movement by an operator results in the release of the second end zone such that the second end zone moves to its piercing position, and as soon as it pierces, it retracts into the housing (12, 14).</p>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Lithuania	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

DescriptionSINGLE USE LANCET DEVICEBACKGROUND OF THE INVENTION5 Field of the Invention

This invention relates to a lancet device.

Summary of the Invention

In the past, there have been many types of lancet devices. 10 Such lancet devices have come to be recognized as somewhat dangerous since blood is involved; and, therefore, there is a need for a single use lancet device, which is of inexpensive construction and which protectively houses the piercing tip of the needle point or blade point within the lancet housing at all times, 15 before and after use. In other words, the sharpened tip of the lancet is outside the housing only during the actual pricking operation.

More particularly, this invention in one embodiment is of a lancet device which has an elongate spring which is sharpened at 20 one end to form a piercing tip, while the other end is captivated within the housing of the lancet. Prior to use, the spring is entirely captivated within the housing in a cocked position and held in that position by a holding pin. The pin is swingable upon pressing a lever arm so that the energy stored in the cocked spring 25 is released and the sharpened tip travels through an opening for the pricking operation and immediately retracts within the housing to its normal, parked position. In other words, the normal, relaxed position of the spring is with the tip protectively within the housing. Prior to use, the spring is in a cocked position. 30 In use, the tip moves from the cocked position to a piercing position but returns immediately to the normal relaxed position with the tip protectively and completely within the housing.

It is an object of this invention to provide a simple lancet 35 device of inexpensive construction which includes a spring with a pointed tip end for use in pricking in order to obtain a sample of blood and the tip is at all times protectively within the housing except momentarily when the pricking operation is performed.

Brief Description of the Drawings

Figure 1 is a perspective view illustrating the use of the single use disposable lancet device and with the lancet housing being grasped by a user and held in piercing relation to the thumb pad of a patient.

Figure 2 is a view taken on the plane indicated by the line 2-2 of Figure 1 and looking in the direction of the arrows and illustrating the interior of the base portion of the housing and a cover portion of the housing, the latter being hingedly connected to the base portion and being partially shown.

Figure 3A is a view taken on the plane indicated by the line 3-3 of Figure 2 and looking in the direction of the arrows to illustrate the pointed end of the lancet captivated in a cocked position within the housing.

Figure 3B is a view in cross section taken on the plane indicated by the line 3-3 of Figure 2 and looking in the direction of the arrows and illustrating the pointed end of the lancet device in a momentary position of piercing and with arrows indicating the direction of force and movement.

Figure 3C is a view taken on the plane indicated by the line 3-3 of Figure 2 and looking in the direction of the arrows and illustrating the lancet spring in a normal, relaxed position, after use.

Figure 4 is a partial view to illustrate the spring in a cocked position and a) illustrating the direction of movement of the piercing tip when released for momentary movement into piercing engagement with the flesh of a user, shown in dotted lines, and b) a relaxed position with the pointed tip retracted and within the housing, also shown in dotted lines.

Figures 5A, 5B, and 5C illustrate the operation of the device with the spring with the pointed end in a cocked position in Figure 5A; in an extended piercing position shown in Figure 5B; and in a relaxed position in Figure 5C with the pointed end within the lancet housing.

35

Detailed Description of the Preferred Embodiment

Use of the single use disposable lancet device is seen in Figure 1; and it is designated by the numeral 10. In this

embodiment, it is composed of a housing having a base portion 12 (also see Figure 2) and a cover portion 14. The base portion of the housing may be hingedly connected to the cover portion 10, for swinging movement of the cover portion into closing relation of the interior 16 of the housing base portion 12. Within the housing, there is captivated a spring 18 with a first end zone 20 and a pointed second end zone 22. The spring is held in a cocked position by a holding tip means or pin 24 in the housing and in adjacent relation to an opening 26 in the housing. A lever arm 28 is pivotally connected as at 30 and 32 to the base portion. Thus, as seen for example in Figure 3B, when the operator means on the second end zone 34 of the lever arm 28 is pressed in the direction of the arrowed line 36 in Figure 3B, the pin 24 will release the end 22 by pivotally tilting in the direction of the arrowed line 39 so that the pointed tip moves downwardly as shown by the arrowed line 40 through the opening 26, moving from the cocked position shown in Figure 3A to the piercing position shown in Figure 3B and subsequently to a normal or relaxed position shown in Figure 3C with the piercing tip protectively within the housing. This operation is also shown in Figure 4. Further, as illustrated in Figure 3A, the second end zone 34', in an alternative embodiment, includes a stepped configuration such that when the operator means of the second end zone 34' are utilized, an operator's finger will not penetrate the housing.

In a preferred embodiment, the housing is of one piece molded plastic material and the spring is a flat spring material of elongate form formed with a crotch as at 41 which engages the pin 24 when in the cocked position, see Figure 5A and Figure 4. The tip of the spring is pointed and thus there is combined the operation of the spring and the needle point or blade point. The means captivating the spring are seen for example in Figure 4 wherein a notch 43 is provided to receive the end 20 of the spring. Also in the preferred embodiment, see Figure 2, there may be a slight interconnection 47 of the end of the lever so that when pressure is applied as in the direction of the arrow 36 in Figure 3B, this weakened section will break. Thereafter, a user will know that the device has been used. As seen in Figure 2, a preferred embodiment provides an arcuate recess 51 annularly arranged about the opening

26 to serve as a shield and to cradle the end of the finger or thumb of a user. The recess 51 is also adapted to enable use of the lancet device on an earlobe, heel, or other similar location.

Thus, this invention actually uses the spring as a needle without the need for separate pieces, the spring functioning to push the lancet upward so that the needle tip on the hub pops out of the lancet housing and with the important feature that upon release of the cocked lancet blade or needle, stored energy in it is released such that it travels through the normal position to pierce a user and automatically retracts so that the sharpened tip is completely within the lancet housing and protectively housed therein. In the preferred configuration, the housing is generally disk shaped and about the size of a quarter to a half-dollar size. It is preferred that it be round and the housing may be in two parts which are snapped, glued, hinged, or welded together.

While this invention has been shown in what is considered to be a practical and preferred embodiment, it is recognized that departures may be made within the spirit and scope of this invention which should therefore not be limited except as set forth 20 in the claims which follow and within the doctrine of equivalents.

Claims

1. A single use disposable lancet device comprising:
a housing, said housing including a lever arm having a
first end zone and a second end zone,

5 a holding member connected to said second end zone of
said lever arm, said holding member extending within said housing,
a spring member within said housing, said spring member
including a distal end, a proximal end, and a pointed lancet tip
at said distal end, said proximal end being operably connected to
10 said housing,

said housing having an opening sized to permit said
pointed tip to project exterior to said housing,

15 said spring member being disposed within said housing in
an initial pre-tensioned cocked position wherein said distal end
is in releasable engagement with said holding member and said
spring member is biased for movement into an unstressed position,

said housing being structured and disposed to
protectively shield said pointed tip of said spring member in said
cocked position,

20 said lever arm being pivotally connected to said housing
between said first end zone and said second end zone such that
actuation of said first end zone causes said holding member to
disengage from said distal end of said spring member,

25 said spring member being pivotally moveable from said
initial pre-tensioned position through said unstressed position to
a piercing position wherein said pointed tip momentarily projects
exterior of said housing opening, said spring member rebounding
from said piercing position and finally coming to rest in said
unstressed position,

30 said housing being structured and disposed to
protectively shield said pointed tip of said spring member in said
final unstressed position,

said housing comprising a means for shielding said spring
member from being displaced from said final unstressed position.

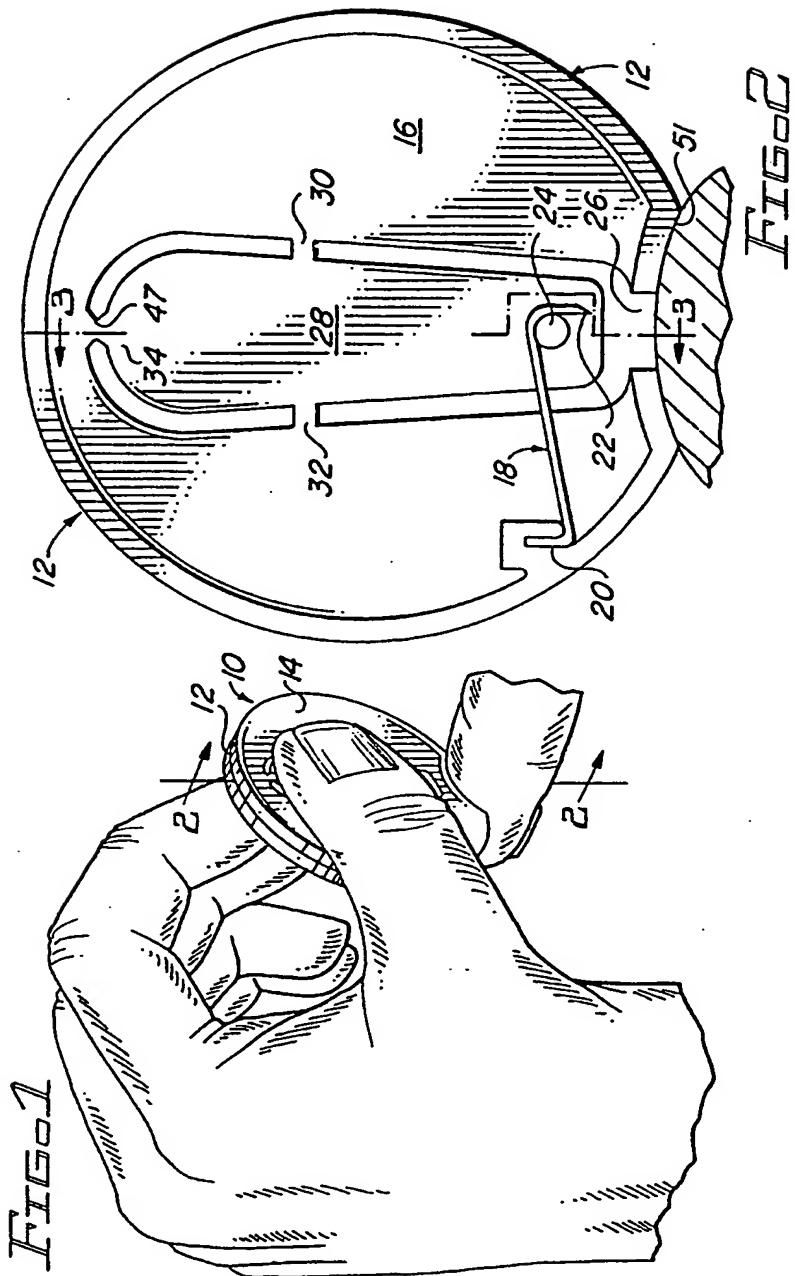
35 2. A lancet device as recited in claim 1 wherein said spring
member is of elongate configuration and said pointed tip is
integrally formed therewith.

3. A lancet device as recited in claim 1 wherein said lever arm is integrally formed with said housing.

4. A lancet device as recited in claim 1 wherein said first end zone of said lever arm has an outwardly raised configuration.

5. A lancet device as recited in claim 1 wherein said first end zone of said lever arm includes a frangible section connected to said housing in said initial pre-tensioned position, said frangible section being breakable upon actuation of said first end zone so as to indicate that the lancet device has been used.

1 / 3



2 / 3

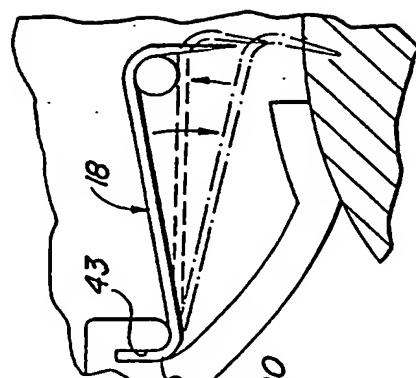


FIG. 4

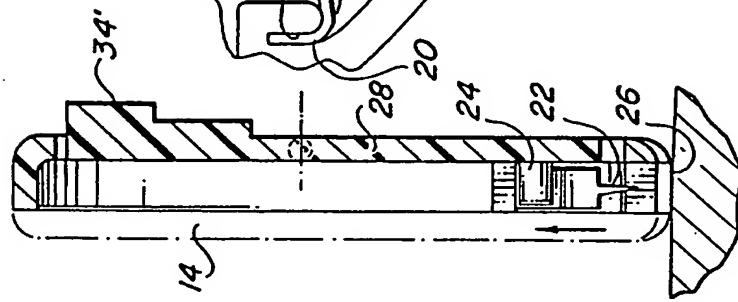


FIG. 3C

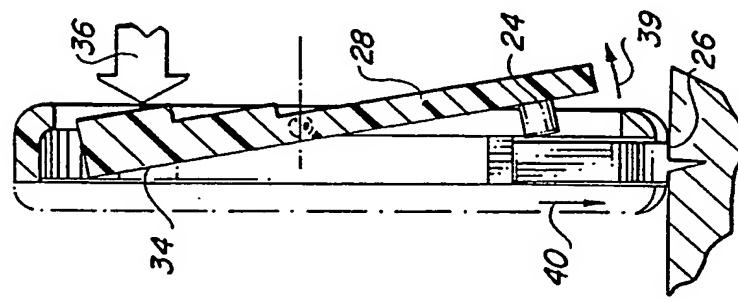


FIG. 3B

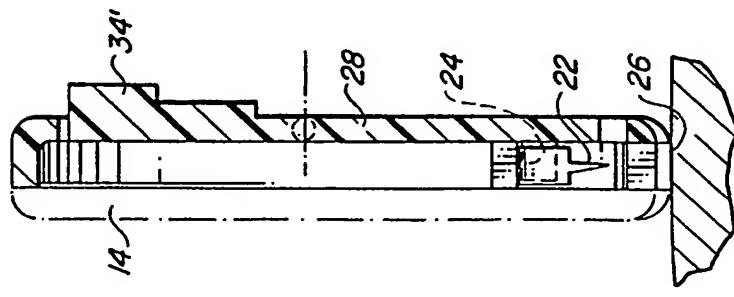
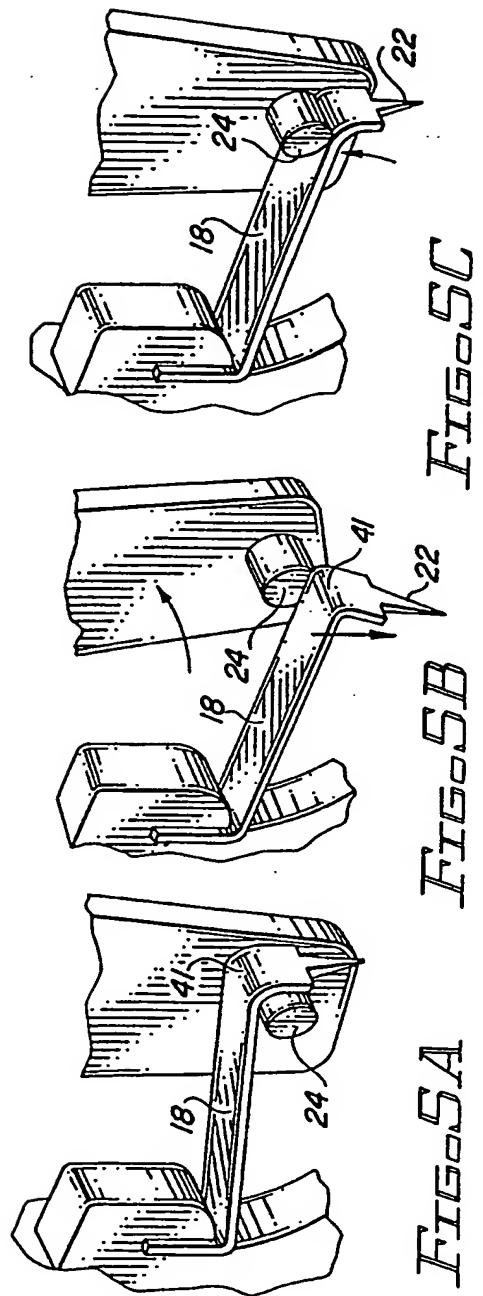


FIG. 3A

3 / 3



INTERNATIONAL SEARCH REPORT

International application No. PCT/US94/12982

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A61B 17/32
US CL :606/182

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 128/314; 604/164, 170; 606/167, 181-183,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 3,034,507, (J. B. McCONNELL ET AL.), 15 May 1962. See the whole document.	1-5
X	US, A, 5,133,730, (BIRO ET AL.), 28 July 1992. See the whole document.	1, 3
A	US, A, 4,139,011, (BENOIT ET AL.), 13 February 1979. See the whole document.	1-5
A	US, A, 4,157,086 (MAIORANO ET AL.) 05 JUN 1979, whole doc.	1-3

<input type="checkbox"/>	Further documents are listed in the continuation of Box C.	<input type="checkbox"/>	See patent family annex.
"	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Z"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
01 MARCH 1995	04 APR 1995
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer NANCY MULCARE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0829

Form PCT/ISA/210 (second sheet)(July 1992)*